DOCUMENT RESUME

ED 348 954 IR 015 616

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|---|---|
| TITLE | Computer Competencies for All Educators in North Carolina Public Schools. Revised. |
| INSTITUTION | North Carolina State Dept. of Public Instruction, Raleigh. |
| PUB DATE | Mar 92 |
| NOTE | 23p.; For the 1985 edition, see ED 264 828. |
| PUB TYPE | Guides - Non-Classroom Use (055) |
| EDRS PRICE | MF01/PC01 Plus Postage. |
| DESCRIPTORS | Behavioral Objectives; *Computer Literacy; *Computer Science Education; Elementary Secondary Education; *Inservice Teacher Education; Microcomputers; *Minimum Competencies; Postsecondary Education; *Public Schools; Staff Development; State Programs; *Teacher Certification |
| IDENTIFIERS | *North Carolina |

ABSTRACT

The task force on computer education, convened by the Department of Public Instruction in North Carolina, developed a flexible model to assist schools in coping with inservice for existing and prospective personnel and for higher education to provide training for teachers and other school personnel in computer education. Actions subsequent to the adoption of this model in 1985 have established a certification for supervisors of computer education and introduced an endorsement for computer education teachers. The two basic levels and two certifications are: (1) Level I--Computer Competencies for All Educators (a minimum exposure to the uses of microcomputers in a K-12 school setting); (2) Level II--Computer Competencies and Utilization in Content Areas--these consist of core competencies with a few special skills for each content area and include arts education (K-12), communication skills (6-12); computer education skills (K-12); exceptional children education (K-12); healthful living education (K-12); library media skills (K-12); mathematics education (6-12); science education (6-12); second language education (6-12); social studies education (6-12); and vocational education (6-12); (3) Special Endorsement in Computer Education--endorsement for teachers teaching courses coded as Computer Education or serving as computer resource teachers; and (4) Instructional Technology Specialist Computer Certification--supervisory, graduate certification. Guidelines for teacher education programs for the instructional technology specialist certification are also detailed. (ALF)

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# Computer Competencies For All Educators In North Carolina Public Schools

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**Raleigh, North Carolina**
**Revised--March 1992**

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## Table of Contents


- Computer Education Competencies - Teacher Education ---------- 1
- Level I - Computer Competencies -- All Educators
  - Overview ---------- 2
  - Competencies ---------- 3
- Level II - Computer Competencies and Utilization
  - Overview ---------- 4
  - Core Content Specific Competencies ---------- 5
  - Special Content Area Competencies
    - Arts Education ---------- 6
    - Communication Skills ---------- 7
    - Computer Education Skills ---------- 7
    - Exceptional Children Education ---------- 7
    - Healthful Living Education ---------- 8
    - Library Media Skills ---------- 8
    - Mathematics Education---------- 8
    - Science Education ---------- 8
    - Second Language Education ---------- 9
    - Social Studies Education ---------- 9
    - Vocational Education ---------- 9
- Special Endorsement in Computer Education (18079)
  - Overview ---------- 11
  - Preparation for Obtaining the Endorsement---------- 11
  - Competencies ---------- 13
- Instructional Technology Specialist - Computers (077)
  - Overview ---------- 15
  - Competencies ---------- 16
  - Guidelines for Teacher Education Programs---------- 19

# COMPUTER EDUCATION COMPETENCIES

## TEACHER EDUCATION

The advent of the microprocessor and the subsequent influx of microcomputers into the K-12 school setting during the decade of the 1980's resulted in an overwhelming need for the majority of K-12 educators to obtain training in computer education. To assist school systems in coping with decisions regarding in-service for existing personnel, as well as competencies needed by prospective personnel, the Department of Public Instruction convened a task force on computer education in the spring of 1983 to develop a flexible model to be used by school systems and higher education in providing training for teachers and other school personnel in computer education. The recommendations of this task force, presented at a public hearing in May 1985, were approved by the State Board of Education later that month. These recommendations -- Computer Education Competencies -- became effective for all North Carolina educators on July 1, 1985. Subsequent action established a certification for supervisors of computer education, introduced an endorsement for computer education teachers, and revised the initial competencies to two levels only. These two levels of competencies and two certifications are:

- Level I -- Computer Competencies for All Educators

- Level II -- Computer Competencies and Utilization in Content Areas

and

- Special Endorsement in Computer Education (18079) -- endorsement for teachers teaching courses coded as Computer Education (2501) or serving as computer resource teachers.

- Instructional Technology Specialist Computers Certification (077) -- supervisory, graduate certification

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*This revision contains the Special Endorsement information, the former Level III shown as the 077 certification, and the Level II competencies reformatted with some changes. These changes include updating of specialized peripherals and the addition of Library Media and Computer Education areas. Revision date: March 1992*
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## LEVEL I

## COMPUTER COMPETENCIES -- ALL EDUCATORS

### Overview

Level I Computer Competencies involve minimum exposure to the uses of microcomputers in a K-12 school setting. The overall goal for this level of competency is to assist an educator in acquiring the knowledge and skills necessary to introduce students to the computer skills identified for all North Carolina students and to plan and implement a program of computer awareness (literacy) as defined in the North Carolina Standard Course of Study, in the "State Plan for Computer Utilization in the North Carolina Public Schools," and in local computer/technology plans. These competencies should also enable an educator to develop an understanding of computer ethics, to recognize the capabilities and limitations of computers, and to develop skills in the evaluation, selection and use of computer courseware to meet specified instructional objectives.

Level I Computer Competencies were approved as appropriate for all North Carolina school personnel in positions requiring certification. Also, local school systems may require personnel who work directly with students but whose positions do not require certification, such as teacher assistants, to obtain Level I Computer Competencies. With the inclusion of computer skills for students in the Standard Course of Study and with the approval by the State Board of Education in May 1991 of computer proficiency as a graduation requirement beginning with the Class of 2000, all teachers and personnel working with students in the instructional program need the skills and knowledge contained in the Level I Computer Competencies to help students succeed academically.

Individuals may document the Level I Computer Competencies by course credit, by self-documentation with approval by the local unit, by a mixture of in-service and documentation, or by a variety of other actions designed by the local education agency. All graduates of North Carolina teacher education programs should have obtained Level I Computer Competencies as part of their teacher education program.

Initially, the Level I Computer Competencies were a requirement for state accreditation of the local school system, being one of the opportunity standards. With the passage of the Flexibility and Accountability Act -- Senate Bill 2, school systems are not required, but have the option, to select the Level I Computer Competencies as one of their Senate Bill 2 standards. Thus while participating in Senate Bill 2, a school system may not be addressing Level I Computer Competencies as a requirement for their personnel.

## LEVEL I - COMPUTER COMPETENCIES FOR ALL EDUCATORS

Competencies Needed By All Educators

1.0 All educators should be able to demonstrate an appropriate understanding of the basic concepts of hardware and software in relation to the use of the computer by:

- 1.1 Displaying general knowledge of computer technology, particularly as it relates to hardware and software applications.
- 1.2 Exhibiting familiarity with the basic components of a computer system; e.g., input/output, storage, central processing unit.
- 1.3 Performing computer operations: on-off sequence, loading/running/ saving/copying programs, printing program output.

2.0 All educators should be able to demonstrate knowledge of the capabilities and limitations of computers and programs by:

- 2.1 Identifying current uses of computers in various areas; e.g., home and recreation, business, industry, transportation.
- 2.2 Distinguishing between computer capabilities and limitations with special emphasis on its use as an instructional tool.

3.0 All educators should be able to demonstrate the ability to discuss the effects of computers on society by:

- 3.1 Organizing programs on the current issues which have evolved as a result of the computer; e.g., personal privacy, ethical issues, copyright issues.
- 3.2 Identifying resources to use to interpret the potential uses of computers and other technologies; e.g., robotics, artificial intelligence, electronic databases.

4.0 All educators should be able to demonstrate the ability to use the computer in instructional programs by:

- 4.1 Identifying, evaluating and selecting effective courseware using accepted evaluative criteria.
- 4.2 Identifying and/or developing teaching strategies necessary to integrate computer courseware into the on-going instructional program.
- 4.3 Using the computer for Computer Assisted Instruction (CAI); e.g., drill and practice, simulations/games/models, tutorials, problem solving.
- 4.4 Using the computer for Computer Managed Instruction (CMI); e.g., student enrollment, student performance and grade reporting.
- 4.5 Identifying effective and various uses of the computer as a tool to support the instructional programs; e.g , word processing, data location and retrieval, test generation.

## LEVEL II

## COMPUTER COMPETENCIES AND UTILIZATION IN THE CONTENT AREAS

### Overview

Level II Computer Competencies should prepare educators to use computers as both instructional and management tools in their curriculum specialization areas. Whereas Level I training provides an information base and minimal skill development for all educators, Level II training should enable teachers (grades 6-12) to incorporate the use of computers into their content area instructional planning and classroom activities. Level II competencies should provide the necessary knowledge and skills to design unit/lesson plans, evaluate and select appropriate computer courseware, plan effective utilization strategies, implement classroom computer activities, and evaluate the results of computer activities.

The Level II competencies, which focus on the hardware, software, and peripheral components of computer systems, are minimum competencies to be acquired in preparation programs in each subject area at the middle grades (6-9) and secondary (9-12) areas of certification. The competencies identified for K-12 certification areas (arts education, healthful living, library/media etc.) should be required by all teacher candidates in the respective area of certification, regardless of expected employment.

These competencies were approved in July 1985 by the State Board of Education as appropriate specialized skills for educators; however, they were not included as a requirement for state accreditation. They exist as recommended skills for school systems to use in preparing in-service for educators in the content areas and for North Carolina teacher education institutions to include in pre-service curriculum programs. Local education agencies may make these competencies a requirement of a local initiative, but as of January 1992 Level II Computer Competencies are not required by the North Carolina Department of Public Instruction.

Level II Computer Competencies consist of core competencies with a few special skills for each content area. As part of the 1992 revision, the competencies have been formatted in two separate lists: competencies common to each area (core competencies) and competencies particular to a given content area.

Level II Computer Competencies apply to the content areas of:

Arts Education: Visual Arts, Music, Dance, Theater Arts (K-12)
Communication Skills (6-12)
Computer Education Skills (K-12)
Exceptional Children Education (K-12)
Healthful Living Education (K-12)
Library/Media Skills (K-12)
Mathematics Education (6-12)
Science Education (6-12)
Second Language Education (6-12)
Social Studies Education (6-12)
Vocational Education (6-12)

COMPUTER COMPETENCIES FOR TEACHERS

WITH

CONTENT AREA CERTIFICATION

Core Competencies

1.0 All content area teachers should demonstrate an understanding of basic concepts of computer hardware in relation to their subject area by:

1.1 Exhibiting a working knowledge of computer technology.

1.2 Being prepared to set up a computer and/or terminal.

1.3 Exhibiting familiarity with the basic components of a computer system; i.e., input/output, storage, retrieval.

1.4 Performing computer operations: on-off sequence loading/executing/printing, saving/copying programs.

1.5 Understanding the various types of computers and their designed tasks; e.g., "mainframe", "mini", and "micro" computers.

2.0 Content area teachers should demonstrate a knowledge of Computer Assisted Instruction (CAI), Computer Managed Instruction (CMI), and authoring programs by:

2.1 Identifying, evaluating, and selecting software programs (computer assisted instruction (CAI)) appropriate for instructional purposes in the content area program.

2.2 Identifying, evaluating, and selecting software programs appropriate for classroom management (CMI); e.g., student enrollment, grades, student performance, individualized education programs (IEP), and other classroom-related recordkeeping.

2.3 Identifying, evaluating, and selecting software programs appropriate for clerical recordkeeping in the operation of the classroom/facilities/lab; e.g., inventory of consumable and non-consumable supplies, equipment, instruments, and materials; purchase requests; data and statistical analysis.

2.4 Being familiar with authoring systems and knowing how to use these specifically designed software programs for instructional purposes, including modifying these programs for instructional use.

3.0 The content area teacher should demonstrate an understanding of the use of peripheral devices, both general items and those specific to the content area, by:

3.1 Knowing how to use video technology -- videotape recorders/players and laserdisc technology -- to enhance content area teaching and learning experiences.

3.2 Knowing how to select and use special input and output peripherals for instructional and management purposes.

3.3 Exhibiting an awareness that technology is constantly changing; therefore, the individual professional must actively seek information pertaining to the ongoing status of electronic instructional technology.

Special Content Area Competencies

4.0 The content area teacher should demonstrate the understanding and use of electronic instructional technology for content specific activities by:

ARTS EDUCATION

Visual Arts

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: graphic tablets, light pens, mouse, modem, video cameras.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated art.

Music

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: keyboards, guitar synthesizers, electronic musical instrument devices, midi interfaces.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated musical compositions.

Dance

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: keyboards, graphic tablets, electronic synthesizers.

4.2 Knowing how to select and use appropriate printers to produce "hard" copies of computer generated dance notations to assist in the development of choreography.

Theater Arts

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: lighting boards; graphic tablets; electronic stage, lighting and sound design devices.

4.2 Knowing how to select and use appropriate printers to produce "hard" copies of computer generated theater staging and choreography.

COMMUNICATION SKILLS

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizers, graphic tablets, mouse, scanners, video cameras.

4.2 Knowing how to select and use appropriate peripherals to produce "hard" copies of computer generated information, both in desktop print format and desktop video format.

COMPUTER EDUCATION SKILLS

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: modems, mouse, scanners/digitizers, video cameras, voice/sound recorders/synthesizers and digitizers, graphic tablets.

4.2 Knowing how to select and use appropriate peripherals to produce "hard" copies of computer generated information, both in desktop print format and desktop video format.

EXCEPTIONAL CHILDREN EDUCATION

4.1 Exhibiting an ability to use peripherals, such as: voice synthesizer, graphic tablet, mouse, joystick, modem, printer, video cameras, scanner.

4.2 Knowing how to select and interface computers with video recording equipment.

4.3 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

HEALTHFUL LIVING EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizers, graphic tablets, mouse, scanners, video cameras.

4.2 Knowing how to select and use appropriate printers to produce "hard" copies of computer generated information.

LIBRARY/MEDIA SKILLS

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: modems, light pens, mouse, scanners/digitizers, video cameras.

4.2 Knowing how to select and use appropriate peripherals to produce "hard" copies of computer generation, such as devices to produce shelf/catalog cards, bar code strips, desktop publications, desktop video productions.

MATHEMATICS EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizer, graphic tablets, mouse, joystick, modem, lab probes, scanners.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

SCIENCE EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizer, graphic tablets, mouse, joystick, modem, lab probes, scanners.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

SECOND LANGUAGE EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizer, graphic tablet, mouse, joystick, modem, scanners, video cameras.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

SOCIAL STUDIES EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizer, graphic tablet, mouse, joystick, modem, scanners, video cameras.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

VOCATIONAL EDUCATION

4.1 Exhibiting a familiarity and an understanding for using additional input peripherals and the related software, such as: voice synthesizer, graphic tablet, mouse joystick, modem, scanner, video cameras.

4.2 Knowing how to select and use appropriate printers and interfaces to produce "hard" copies of computer generated information.

In addition to the listed electronic instructional technology competencies for Vocational Education, Business and Office Education should also include the following computer competencies:

1.0 Utilize computerized accounting systems and explain how they are integrated into the accounting process.

2.0 Demonstrate proper techniques and skills in the operation of up-to-date keyboarding equipment, including typewriters and microcomputers.

3.0 Design an information system--including equipment, sources of information, and procedures--to be used in the management decision-making process by:

3.1 Identifying equipment and procedures used in information systems.

3.2 Identifying the impact of computers on management.

4.0 Analyze the role of computerized data processing in our society and its implications for the future by:

4.1 Identifying business applications appropriately processed by a computer.

4.2 Interpreting results of processed data, applying reason and logic in evaluating the validity of results obtained.

4.3 Distinguishing purposes and levels of computer hardware and software.

4.4 Identifying features of management information systems.

4.5 Describing various data storage and retrieval systems.

4.6 Designing and preparing data for computer processing.

4.7 Demonstrating proper techniques and skills in using various pieces of computer equipment.

5.0 Analyze results of processed data, applying reason and logic in evaluating the methods used and results obtained by:

5.1 Demonstrating the ability to execute package programs common to business.

5.2 Demonstrating the ability to write in at least one business computer language and in BASIC.

# SPECIAL ENDORSEMENT
# IN
# COMPUTER EDUCATION
# (18079)

## Overview

The Special Endorsement in Computer Education was established for partial or full-time school computer teachers or computer resource teachers for one or more schools. Preparation for this position should provide educators extensive knowledge and skills to teach the use of computers in grades K-12, to work with students and other teachers to use computers in the on-going instructional program, and to serve as a computer education leader for a school.

An individual with the Special Endorsement in Computer Education should have in-depth understanding of the features, operation, and instructional use of computer hardware and software; the knowledge of two educational programming languages with the ability to teach one of the languages; the skills to select and integrate computer hardware, software, ancillary instructional materials, and peripherals into the ongoing instructional program; and the leadership skills necessary to advise and contribute to school level technology planning. This individual may be identified by a variety of titles such as computer teacher, school computer coordinator, computer resource teacher, computer lab teacher, or computer education specialist.

**The endorsement is required for teachers of a course coded as computer education (2501), either one period to full time, and those individuals in a position using the special legislative funds for a math, science, or computer resource teacher if the position has been identified to include computer education.**

An individual with the Special Endorsement in Computer Education is eligible to work in a teacher position. The endorsement is awarded as an "A" certificate unless the individual also holds the Instructional Technology Specialist-Computers (077) certification. Then, the endorsement is awarded at the "G" level.

## Preparation for Obtaining the Special Endorsement

Two options exist for obtaining the Special Endorsement in Computer Education :

(1) eighteen semester hours of appropriate computer education or programming courses

(2) successful completion of a documentation process.

Option 1: Individuals with a current North Carolina teaching certificate and eighteen semester hours of coursework may apply to the Division of Certification of the North Carolina Department of Public Instruction, submitting the coursework documentation with the necessary personal data (name and address, social security number, current certification information). The certification staff will review the coursework for satisfaction of the endorsement competencies.

Option 2: Individuals employed by a North Carolina school may be recommended by their school system for the Special Endorsement in Computer Education. This option involves a school system administrator submitting a letter to the Division of Certification of the North Carolina Department of Public Instruction asking that the individual (Social Security #) with a current North Carolina teaching certificate receive a provisional Special Endorsement in Computer Education. The individual's certificate is placed on provisional status during the documentation process. This individual receives a documentation packet to complete. The documentation must must include at least six semester hours of appropriate coursework. Other documentation may be items such as local in-service courses, personal teacher-made materials, or testimony by colleagues. Note: individuals with a North Carolina teaching certificate but not employed currently in a school system may apply themselves to complete the documentation process.

Competencies

1.0 Knowledge and Understanding
Understanding in depth the area of computer technology (hardware, courseware, programming languages, computer use) and its application to the K-12 curriculum. The candidate will be able to:

1.1 Identify hardware and courseware features, purposes, and proper care procedures.

1.2 Demonstrate the ability to set up and operate computers typical of the types predominate in the K-12 school program.

1.3 Demonstrate the ability to execute packaged programs common to instructional use in the K-12 curriculum.

1.4 Provide information on the different programming languages suitable for elementary and secondary students.

1.5 Demonstrate the ability to write in at least one educational programming language (e.g., BASIC, Logo, Pascal, COBOL) at a level sufficient to teach courses in that language and to compare at least two educational programming languages typical of languages in use in the elementary and secondary schools.

1.6 Demonstrate the ability to apply problem-solving techniques and to anticipate, identify, isolate, and correct programming errors.

1.7 Understand computer operation by displaying knowledge of commonly-used data and control structures, of general functions performed by operating systems, of how to structure a problem for computer solution, of how to effectively use storage media, and of common file accessing methods.

1.8 Understand the broad area of computer technology as it relates to teaching and learning theory and practice.

1.9 Identify appropriate use of the computer and computer programs in the K-12 curriculum.

1.10 Provide information on contemporary issues and trends in computer technology (e.g., ethics, copyright).

2.0 Selection and Integration

Ability to apply criteria and strategies for selection and integration/use of hardware, courseware, and computer materials into the on-going instructional computer program. The candidate will be able to:

2.1 Identify criteria, strategies, and reviewing services/information sources for hardware, courseware, and computer material selection and integration.

2.2 Demonstrate the ability to select and integrate appropriate hardware, courseware, and computer materials.

2.3 Provide leadership for a school media or computer advisory committee in selecting computer materials in accordance with the school and school system computer plan and existing curriculum.

2.4 Provide leadership to a computer committee in identifying computer materials that need to be developed to use in the existing curriculum.

2.5 Identify and provide information and training on hardware peripherals and related software appropriate for computer integration in the existing curriculum.

## CERTIFICATION

## INSTRUCTIONAL TECHNOLOGY SPECIALIST--COMPUTERS
## (077)
(Formerly: LEVEL III - COMPUTER SPECIALIZATION)

### Overview

The Instructional Technology Specialist--Computers certification is appropriate for those persons who, through advanced study and preparation, wish to develop extensive knowledge and skill in the area of computer technology (hardware, courseware, programming techniques, sources of information) and its application to the K-12 curriculum. The Instructional Technology Specialist--Computers has the role of decision maker, consultant, and specialist in advising administrators, teachers, and other professional personnel on computer technology. The computer specialist serves as a member of a management team and has responsibilities that include computer skills curriculum planning and implementation; staff development; hardware and courseware evaluation, selection, and integration; production and utilization of resources; and management of personnel and facilities. The computer specialist may be identified by a variety of titles such as computer specialist, computer coordinator, computer resource teacher, instructional specialist for computers, or computer education supervisor.

Preparation programs for the Instructional Technology Specialist--Computers should be sufficiently flexible to allow for differences in the capability, experiences, and educational background of candidates. A candidate for this certification should enter the master's degree program with a North Carolina teaching certification and demonstrate supervisory potential. However, candidates already possessing master's level certification need only obtain those competencies not addressed in a previous program, according to the guidelines and review by a post-secondary institution offering the certification. As of January 1992, the North Carolina institutions offering the 077 certification were East Carolina University, North Carolina State University, UNC-G, Appalachian State University, Western Carolina University, and UNC-C. The program at UNC-CH is approved but inactive as of January 1992.

Candidates for a master's program for the Instructional Terminology Specialist--Computers are advised to simultaneously obtain the Special Endorsement in Computer Education by adding two or more programming courses to satisfy competencies 1.5, 1.6, and 1.7 of the Special Endorsement. Thus, a graduate of the 077 (supervisory, graduate level) with the 18079 endorsement (teaching endorsement) competencies could be recommended for both credentials at the graduate level. This allows the individual to serve in a teacher pay position as a computer resource teacher but receive graduate pay. An individual with the 077 certification is eligible to apply for and hold a supervisory position which specifies computer skills responsibilities. However, the possession of the 077 certificate does not necessitate either a supervisory position or supervisory pay.

Competencies

1.0 Knowledge and Understanding
Understanding in depth the area of computer technology (hardware, courseware, programming techniques, informational resources) and its application to the K-12 curriculum. The candidate will be able to:

1.1 Identify hardware and courseware features, purposes, and proper care procedures.

1.2 Demonstrate the ability to set up and operate computers typical of the types predominant in the K-12 school program.

1.3 Demonstrate the ability to execute package programs common to instructional use in the K-12 curriculum.

1.4 Provide information on the different programming languages suitable for elementary and secondary students.

1.5 Demonstrate the ability to write in at least one educational programming language (e.g., BASIC, Logo, Pascal, COBOL) at a level sufficient to teach a course in that language.

1.6 Identify sources of information on computer technology topics appropriate for the K-12 curriculum.

1.7 Understand the broad area of computer technology as it relates to teaching and learning theory and practice.

1.8 Identify appropriate uses of the computer in the K-12 curriculum.

1.9 Provide information on contemporary issues and trends in computer technology (e.g., ethics, copyright).

2.0 Program Planning and Implementation
Ability to plan, organize, develop, implement, interpret, and evaluate a computer skills program as part of the on-going instructional program. The candidate will be able to:

2.1 Develop and modify annual and long-range goals for a comprehensive computer skills program as part of the on-going instructional program.

2.2 Provide leadership for a school system or school computer committee on using computer technology in the K-12 instructional program.

2.3 Implement procedures and direct activities for developing computer skills program guidelines and materials.

2.4 Develop, implement, and monitor programs for computer skills staff development activities.

2.5 Establish and implement procedures for evaluation of the computer skills program; in particular, procedures that use the computer for data collection and evaluation.

3.0 Evaluation, Selection, and Integration

Ability to apply criteria and strategies for evaluation, selection, and integration/use of hardware and courseware into the ongoing instructional program. The candidate will be able to :

3.1 Identify criteria, strategies, and reviewing services/information sources for hardware and courseware evaluation, selection, and integration.

3.2 Develop, implement, and monitor procedures for evaluation, selection, and use of instructional materials for computer skills.

3.3 Develop, implement, and monitor procedures for evaluation, selection, and use of computers in the K-12 curriculum to meet established instructional objectives.

3.4 Provide leadership for a school system or school media advisory or computer committee in evaluating and selecting computer skills materials in accordance with the school system computer plan and existing curriculum.

4.0 Production and Utilization of Resources

Ability to design and implement procedures and activities for using computer skills materials and computer hardware, as well as for developing/producing computer-related materials to facilitate the teaching/learning process. The candidate will be able to:

4.1 Develop, implement, and monitor staff development activities on strategies needed to integrate computer technology into the K-12 curriculum and on the use of computer skills materials.

4.2 Provide leadership to a computer committee in identifying computer skills materials that need to be developed.

4.3 Design and conduct activities on techniques and courseware (e.g., authoring systems, teaching aid generators) that can be used to produce computer skills materials.

4.4 Identify and provide information and training on hardware peripherals and related software appropriate for enhancing computer use.

5.0 Organization and Management

Ability to establish, implement, and manage computer procedures and practices involving program, personnel, resources, and facilities. The candidate will be able to:

5.1 Recognize the school system's or school's organizational pattern, curriculum and instructional objectives, finance regulations, personnel policies, and building facility restrictions affecting the computer skills program.

5.2 Understand and use management skills in dealing with the program, personnel, resources, and facilities applicable to the computer skills program.

5.3 Assist with the acquisition process for computer resources: hardware, courseware, and facility items.

5.4 Provide leadership and assistance for the organization and maintenance of an inventory of school system or school computer resources.

The program of preparation should be characterized by flexibility, individualization, and personalization to allow for differences in the capability, experiences, and educational background of candidates. Programs of study for all students will contain common elements; however, the mix of these elements will vary for individual programs of study. It is assumed that candidates admitted to this master's degree program will have obtained teaching certification in a North Carolina approved area and will have exhibited leadership potential necessary for a supervisory position. The program should be sufficiently flexible to allow students who have already obtained a master's level certification, specifically certification in curriculum and/or supervision, to obtain those additional competencies not previously addressed.

Guideline 1: The program should provide a general understanding of the broad area of computer technology as it relates to teaching and learning theory and practice and to the K-12 content areas.

The program should provide a general study of computer technology (hardware, courseware, programming techniques (at least one educational programming language), sources of information) and its relationship to established learning theory and to instruction in a K-12 curriculum. A study of the contemporary issues (e.g., ethics, copyright) and trends both in the development of the technology and in education should be part of the program of study. The program also should provide experience with the field of computing in which the computer is used as a tool for and as an object of instruction.

Guideline 2: The program should provide for the development of competencies in planning, organizing, implementing, interpreting, and evaluating a computer skills instructional program at school system levels.

The prospective computer specialist should develop the ability to plan and implement the educational aspects of a computer skills program with respect to theories, principles, and practices of curriculum development, instructional processes, and learning evaluation. The Instructional Technology Specialist-- Computers should have the ability to develop computer skills curriculum and/or activities based on an understanding of the needs and interests of the learner.

Study in this area should also include evaluation, selection, and utilization techniques for computer hardware and courseware appropriate for a computer skills program.

Guideline 3: The program should develop knowledge and provide experiences designed to promote the acquisition of several different kinds of leadership styles and understanding of when each style should be used.

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Preparation under this guideline should develop a comprehension of principles and practices of instructional leadership--their development, current status and trends. Consideration should be given to the techniques of teacher orientation, in-service education programs, individual and group conferences, and planning/research investigations. The study should include consideration of school organization and administration as it relates to the competence needed by the instructional leader to serve effectively as a member of an educational management team.

Guideline 4: The program should provide an understanding of the purpose, organization, and administration of school systems with special emphasis on the role of the computer specialist in developing and directing activities related to computer technology.

Study in this area should develop understanding of the organization and administration of the school, curriculum patterns, and the computer specialist's role in relating the school program to the community. Emphasis should be placed upon establishment of appropriate computer technology learning environments, recordkeeping and inventory, school finance, personnel supervision, and management of program and resources.

Guideline 5: The program should develop an individual awareness of the need for continued learning on the job and for intelligent consumption of research and current information.

The program should provide opportunities for the computer specialist to develop the habits and attitudes necessary for continued learning. Emphasis should be placed on maintaining the professional capability needed to interpret the trends and developments resulting from the frequent change in the area of computer technology.